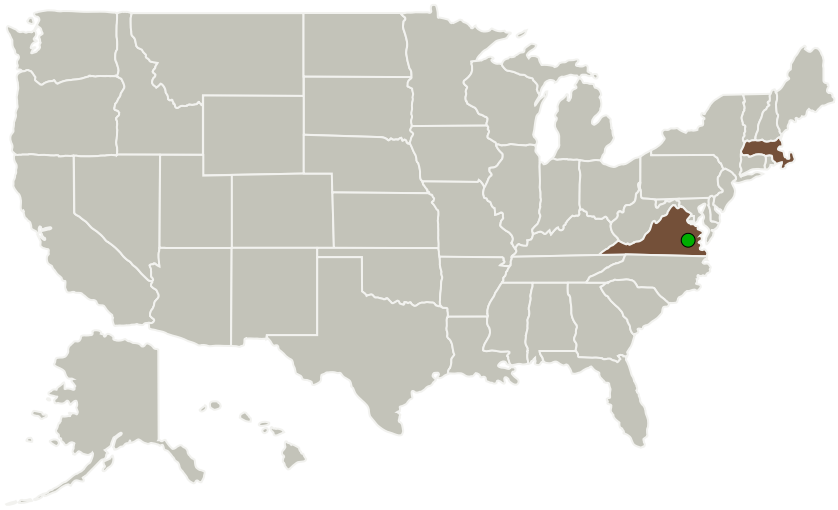
# Solid State Multiwavelength LIDAR for Volcanic Ash Monitoring, Phase I

Completed Technology Project (2011 - 2011)

## Project Introduction

Physical Sciences Inc. proposes to develop a compact, multiwavelength LIDAR with polarization analysis capability that will be able to identify volcanic ash clouds at distance. The system will be developed specifically for airborne deployment, including on Unmanned Aerial Systems. A UAS-equipped with such a LIDAR could provide valuable supplementary information to that available from existing and planned satellite assets for defining and tracking volcanic ash plumes. The system footprint will be minimized by taking advantage of all solid-state laser transmitters such as emerging metal doped fiber amplifiers. The Phase I program will determine the most appropriate wavelengths for use via system modeling and then will select laser transmitter hardware. Additional modeling will determine the transmit pulse energy and receive aperture size. The system will be designed to be eyesafe. A complete conceptual design for an Airborne Multiwavelength Lidar will be developed. The technology readiness level at the entrance to the Phase I program is estimated to be 2 and at the exit of the program will be 3. The Phase II program will design, fabricate and ground test a prototype LIDAR system. Opportunities for a flight demonstration will be identified.

## Primary U.S. Work Locations and Key Partners

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| Physical Sciences, Inc. | Lead Organization | Industry | Andover, Massachusetts |
| Langley Research Center(LaRC) | Supporting Organization | NASA Center | Hampton, Virginia |

| Primary U.S. Work Locations | |
|---|---|
| Massachusetts | Virginia |

## Project Transitions

**February 2011:** Project Start

**September 2011:** Closed out

**Closeout Documentation:**

- Final Summary Chart*(https://techport.nasa.gov/file/138518)*

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Physical Sciences, Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

David M Sonnenfroh

**Co-Investigator:**

David Sonnenfroh

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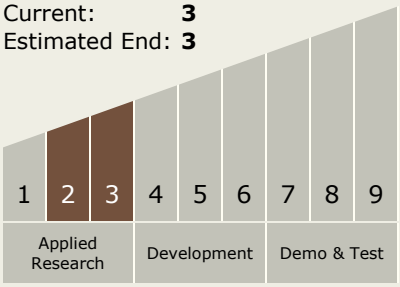
## Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**




## Technology Areas

**Primary:**

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers

## Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System